

AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions and listings of claims in the application.

Listing of Claims

1-7. Cancelled.

8. (Previously Presented) An apparatus for regulating the pressure of fluid supplied to a dispenser, comprising:

a housing having a fluid inlet and a fluid outlet, a first partial volume communicating with said fluid inlet, a valve seat defining at least a portion of said first partial volume, a second partial volume communicating with said fluid outlet, and a channel extending through said valve seat and communicating with said first and second partial volumes;

a valve positioned in said housing and defining at least a portion of said first and second partial volumes, said valve being responsive to pressures within said second partial volume so as to move between an open and closed position within said first partial volume, wherein said valve includes a sealing surface adapted to contact said valve seat in said closed position so as to seal off said channel from said first partial volume; and

a piston having a piston disc defining at least a portion of said second partial volume and a piston rod extending through said channel, said piston rod adapted to engage said sealing surface of said valve so as to move therewith, said piston disc

being coupled to said piston rod such that said second partial volume expands when said valve moves from said open position to said closed position.

9. (Previously Presented) The apparatus of claim 8, wherein said second partial volume includes a cylindrical portion proximate said channel, an outlet portion proximate said fluid outlet, and an intermediate portion positioned between said cylindrical portion and said outlet portion, said cylindrical portion being at least partially defined by said piston disc and said outlet portion being at least partially defined by said valve.

10. (Previously Presented) The apparatus of claim 9, wherein said valve comprises:
a sealing body positioned within said first partial volume opposite said valve seat;
a base member retained within said housing and having a valve guide configured to support said sealing body, said valve guide being exposed to said outlet portion of said second partial volume.

11. (Previously Presented) The apparatus of claim 10, wherein said valve further comprises a valve spring positioned between said base member and said sealing body such that said valve is biased towards said closed position.

12. (Previously Presented) The apparatus of claim 8, wherein said valve is biased in said closed position.

13. (Previously Presented) The apparatus of claim 8, further comprising:
a ceramic insert received in said housing and defining said valve seat, said channel
extending through said ceramic insert.

14. (Previously Presented) The apparatus of claim 8, wherein said housing further
includes a cylinder for receiving said piston, said piston disc further including a lip seal
adapted to form a seal between said piston disk and said cylinder.

15. (Previously Presented) The apparatus of claim 14, further comprising:
a cover member coupled to said housing over said cylinder, said cover member having
a bore for accommodating said piston.

16. (Previously Presented) The apparatus of claim 15, wherein said cover member
further includes an opening, a protective cover removably positioned over said opening,
and a passage extending from said opening into said cylinder.

17. (Previously Presented) The apparatus of claim 15, wherein said piston has a top
portion extending through said bore, the apparatus further comprising:
an indicator member coupled to said top portion of said piston.

18. (Previously Presented) The apparatus of claim 16, wherein said indicator member
is a screw.

19. (Previously Presented) An apparatus for regulating the pressure of fluid supplied to a dispenser, comprising:

a regulator, comprising:

a housing having a fluid inlet and a fluid outlet, a first partial volume communicating with said fluid inlet, a valve seat defining at least a portion of said first partial volume, a second partial volume communicating with said fluid outlet, and a channel extending through said valve seat and communicating with said first and second partial volumes;

a valve positioned in said housing and defining at least a portion of said first and second partial volumes, said valve being responsive to pressures within said second partial volume so as to move between an open and closed position within said first partial volume, wherein said valve includes a sealing surface adapted to contact said valve seat in said closed position so as to seal off said channel from said first partial volume; and

a regulator piston having a piston disc defining at least a portion of said second partial volume and a piston rod extending through said channel, said piston rod adapted to engage said sealing surface of said valve so as to move therewith, said piston disc being coupled to said piston rod such that said second partial volume expands when said valve moves from said open position to said closed position; and

an adjustor adapted to apply force to said regulator piston, said adjustor comprising:

a housing positioned above said regulator and having an open bottom, a base coupled to said open bottom so as to define a chamber within said housing, and an inlet communicating with said chamber for supplying pressurized gas thereto; and

an adjustor piston having a head portion within said chamber and a rod portion extending through said base, said rod portion adapted to engage said regulator piston such that when a sufficient amount of pressurized gas is supplied to said chamber said adjustor piston causes said valve to move from said closed position into said open position.

20. (Previously Presented) The apparatus of claim 19, wherein said adjustor further comprises a spring member positioned between said base of said housing and said head portion of said adjustor piston such that said adjustor piston is biased within said chamber.

21. (Previously Presented) The apparatus of claim 19, wherein said second partial volume of said regulator includes a cylindrical portion proximate said channel, an outlet portion proximate said fluid outlet, and an intermediate portion positioned between said cylindrical portion and said outlet portion, said cylindrical portion being at least partially defined by said piston disc and said outlet portion being at least partially defined by said valve.

22. (Previously Presented) The apparatus of claim 21, wherein said valve comprises:

a sealing body positioned within said first partial volume opposite said valve seat;
a base member retained within said housing and having a valve guide configured to support said sealing body, said valve guide being exposed to said outlet portion of said second partial volume.

23. (Previously Presented) The apparatus of claim 22, wherein said valve further comprises a valve spring positioned between said base member and said sealing body such that said valve is biased towards said closed position.

24. (Previously Presented) The apparatus of claim 19, wherein said regulator further comprises a ceramic insert received in said housing and defining said valve seat, said channel extending through said ceramic insert.

25. (Previously Presented) The apparatus of claim 19, wherein said housing of said regulator further includes a cylinder for receiving said regulator piston, said piston disc further including a lip seal adapted to form a seal between said piston disk and said cylinder.

26. (Previously Presented) The apparatus of claim 25, wherein said regulator further comprises a cover member coupled to said housing over said cylinder, said cover member having a bore for accommodating said regulator piston.

27. (Previously Presented) A method of regulating the pressure of fluid supplied to a dispenser, comprising the steps of:

communicating the fluid through a fluid inlet and into a first partial volume of a housing, the first partial volume having a valve seat with a channel extending therethrough;

actuating a piston to move a valve within the first partial volume, the valve having a sealing surface adapted to contact the valve seat when the valve is in a closed position, the piston having a piston rod extending through the channel and adapted to engage the sealing surface such that actuating the piston moves the valve into an open position;

communicating the fluid through the channel and into a second partial volume of the housing, the valve being responsive to pressures within the second partial volume;

discharging the fluid through a fluid outlet associated with said second partial volume;

closing the fluid outlet; and

releasing the piston to move the valve into the closed position and to expand the portion of the second partial volume defined by the piston disk.

28. (New) An apparatus for regulating the pressure of fluid supplied to a dispenser, comprising:

a housing having a fluid inlet and a fluid outlet, a first partial volume communicating with said fluid inlet, a valve seat defining at least a portion of said first partial volume, a second partial volume communicating with said fluid outlet, and a channel extending through said valve seat and communicating with said first and second partial volumes;

a first piston movable within said first partial volume between an open position in which said first piston is spaced from said valve seat and a closed position in which said first piston contacts said valve seat to seal off said channel from said first partial volume; and

a second piston having a piston disc defining at least a portion of said second partial volume and a piston rod configured to extend through said channel and engage said first piston, said piston rod being movable with said first piston when said first piston moves between said open and closed positions but independently movable relative to said first piston when said first piston is in said closed position, said piston disc being coupled to said piston rod such that said second partial volume increases or decreases when said piston rod moves.